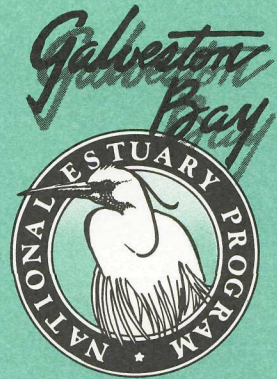


Recreational Fishery By-Catch in the Galveston Bay System



Galveston Bay
National Estuary Program

GBNEP-25
November 1992

Recreational Fishery By-Catch in the Galveston Bay System

Gary E. Saul, Ph.D.
Principal Investigator

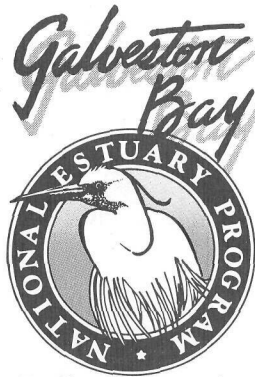
Prepared by
FTN Associates, Ltd.
7101 Highway 71 West, Suite 214
Austin, Texas 78735

In Cooperation with
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

The Galveston Bay National Estuary Program

Publication GBNEP-25
November, 1992

This project has been funded in part by the United States Environmental Protection Agency under assistance agreement # CE-006550-01 to the Texas Water Commission. The contents of this document do not necessarily represent the views of the United States Environmental Protection Agency or the Texas Water Commission, nor do the contents of this document necessarily constitute the views or policy of the Galveston Bay National Estuary Program Management Conference or its members. The information presented is intended to provide background information, including the professional opinion of the authors, for the Management Conference deliberations in drafting of official policy in the Comprehensive Conservation and Management Plan (CCMP). The mention of trade names or commercial products does not in any way constitute an endorsement or recommendation for use.



Policy Committee

The Honorable Rodney Ellis, Chair
Texas Senate

Mr. Buck J. Wynne, III, Vice-Chair
Regional Administrator, EPA Region 6

Mr. John Hall
Chair,
Texas Water Commission

Mr. John Wilson Kelsey
Vice-Chair,
Texas Parks and Wildlife Commission

Ms. Linda Shead
Executive Director
Galveston Bay Foundation

Mr. Charles W. Jenness
Chair,
Texas Water Development Board

Ms. Eileen Crowley
Former President
Greater Houston Partnership
Chamber of Commerce Division

The Honorable Jon Lindsay
County Judge, Harris County

Local Governments Advisory Committee

The Honorable Ray Holbrook, Chair

Management Committee

Mr. Myron O. Knudson, Chair

Ms. Barbara Britton, Vice-Chair

Scientific/Technical Advisory Committee

Dr. Robert McFarlane, Chair

Ms. Teresa Battenfield, Vice-Chair

Citizen's Advisory Steering Committee

Ms. Sharron Stewart, Chair

Ms. Glenda Callaway, Vice-Chair

Galveston Bay Public Forum

Dr. Don Bass, Chair

Program Director

Dr. Frank S. Shipley

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1.0	PURPOSE AND ORGANIZATION	3
2.0	INTRODUCTION	5
2.1	Project Objectives	9
3.0	HISTORICAL DATA REVIEW	11
3.1	Approach	11
3.2	Available Information -- Finfish	11
3.2.1	Texas Parks and Wildlife Department -- Routine Monitoring	11
3.2.2	National Marine Fisheries Service --Marine Recreational Fishery Statistics Survey	12
3.2.3	Texas Parks and Wildlife -- Special Spotted Seatrout Tagging Study	17
3.3	Available Information -- Shellfish	17
3.3.1	Shrimp	17
3.3.2	Recreational Oyster Fishery	25
3.3.3	Recreational Blue Crab Fishery	25
4.0	METHODS	29
5.0	RESULTS AND DISCUSSION	33
5.1	Finfish By-Catch Magnitude	33
5.2	Finfish By-Catch Composition	36
5.3	Finfish By-Catch Seasonality and Geographic Distribution	36
5.4	Recreational Shellfish By-Catch	36
6.0	CONCLUSIONS AND RECOMMENDATIONS	39
6.1	Conclusions	39
6.2	Recommendations	39
7.0	LITERATURE CITED	41

TABLE OF CONTENTS (CON'T)

- Appendix A: Individuals Contacted Regarding Recreational By-Catch Information
- Appendix B: Current North American and International Literature Survey on Fisheries By-Catch
- Appendix C: Estimated Landings, Sizes, and Weights of Selected Species of Finfish from the Galveston Bay System and Coastwide
- Appendix D: Summary of National Marine Fisheries Service Marine Recreational Fishery Statistics Survey Data for the Galveston Bay System by Year and Mode of Fishing
- Appendix E: Catch Rates and Species Composition of Organisms Caught in the Galveston Bay System by Trawl and Oyster Dredge
- Appendix F: Specific Proposals for Estimating Recreational By-Catch in the Galveston Bay System

LIST OF FIGURES

- Figure 1. Distribution of annual coastwide by and pass private-boat fishing pressure and landings among bay systems, May 1979-May 1990 (based on 3-year mean in Sabine Lake system and 11-year means in all other bay systems). Data from Campbell et al. (1991).
- Figure 2. Annual coastwide private-boat fishing pressure (± 1 SE) and landings (± 1 SE) in Texas bays and passes, May 1974-May 1990. Data from Campbell et al. (1991).
- Figure 3. Conceptual model of fate and classification of fish captured by recreational fishermen.

LIST OF TABLES

- Table 1. Number of days surveyed and number of private-boat fishermen interviewed (in parentheses) in the Galveston Bay system and coastwide by year (1974-1991). Data from Campbell et al. (1991).
- Table 2. Estimated sport-boat fishing pressure (man-h x 1000) \pm 1SE, mean fishing-party size (No. of fishermen) and mean trip length (h) for private-boat fishermen in the Galveston Bay system and coastwide for Texas bays by year (1974-1991). Data from Campbell et al. (1991).
- Table 3. Estimated landings of all fishes by sport-boat anglers in the Galveston Bay system and coastwide in Texas bay systems. Data from Campbell et al. (1991).
- Table 4. Number of saltwater fishermen interviews conducted in counties adjacent to the Galveston Bay system. Data from the National Marine Fisheries Service (NMFS) Marine Recreational Fishery Statistics Survey (1979-1985).
- Table 5. Number of fishes landed, released alive, released dead or otherwise discarded by Galveston Bay sport fishermen summed over years by mode and species. Data from NMFS MRFSS (1979-1985).
- Table 6. Summary of effort exerted, catch of spotted seatrout, and by-catch in TPWD spotted seatrout tagging study in Galveston Bay system. Data from TPWD (1981-1983).
- Table 7. Total number of sport oyster dredge licenses and sport shrimp trawl licenses. Sold in Texas by fiscal year (1959-1990).
- Table 8. Galveston Bay sport-shrimping intercepts by year and month. Data from TPWD (unpublished).
- Table 9. NMFS MRFSS recreational data summarized over species, by mode and year and combined over years by mode.
- Table 10. Calculation of sport-boat by-catch factors using NMFS MRFSS data (1979-1985). Factors are summed over species by year for sport-boat fishermen interviews.
- Table 11. Estimated annual sport-boat by-catch for all finfish species combined for the Galveston Bay system using NMFS MRFSS data and TPWD sport-boat landings data for years 1979-1985.

ACKNOWLEDGEMENTS

This report was a collaborative effort between FTN Associates, Ltd. and staff of the Coastal Fisheries Branch, Fisheries and Wildlife Division, Texas Parks and Wildlife Department. Mr. Ralph Rayburn, Chief of Coastal Fisheries at the initiation of this project, provided access to Coastal Fisheries data, computing facilities and staff time. Mr. Robin Riechers provided computer expertise and a wealth of knowledge on fishermen recall studies. Mr Hal Osburn provided guidance, review and the opportunity to explore data and findings with staff at the Rockport Marine Laboratory. My appreciation is extended to them and the staff of Coastal Fisheries.

In addition, I appreciate the assistance of Dr. John Witzig, National Marine Fisheries Service, for his assistance in procuring and working with the Marine Recreational Fishery Statistics Survey data for Texas. The staff at the Galveston Bay National Estuary Program are gratefully acknowledged for providing guidance and encouragement throughout the duration of this project.

RECREATIONAL FISHERIES BY-CATCH IN GALVESTON BAY

Gary E. Saul, PhD.
Principal Investigator

EXECUTIVE SUMMARY

The Galveston Bay National Estuary Program is characterizing the status and trends in resource condition as a foundation for the Comprehensive Conservation and Management Plan for the Galveston Bay system. The purpose of this project was to examine the literature and existing data to determine the magnitude and composition of the recreational finfish and shellfish by-catch in the Galveston Bay system.

A preliminary estimate of the recreational by-catch of sport-boat fishermen was made using a combination of data obtained from the National Marine Fisheries Service's (NMFS) Marine Recreational Fishery Statistics Survey (MRFSS) and routine sport-boat harvest monitoring data provided by the Texas Parks and Wildlife Department (TPWD). Data from the MRFSSs included landings of finfishes, determined to species by NMFS contractors, and by-catch data (numbers and disposition by species) based on fishermen recall during intercept surveys. Data from TPWD included estimated annual landings of finfishes by sport-boat fishermen as determined by TPWD fisheries professionals in intercept surveys.

Recreational sport-boat fishermen caught and released approximately two fish for every fish landed. Because of the limited nature of the data, estimates by species and year were not made. During the period of 1979-1985, the years of concurrent data collection by the NMFS and the TPWD, it was estimated that sport-boat fishermen caught and released between 1.2 and 3.5 million fish in the Galveston Bay system. Approximately 5 percent of the fish reported released, were reported as being released dead. Available literature on hooking and handling mortality suggests that less than 15 percent of red drum released alive and up to 30 percent of spotted seatrout released alive die from injuries or stresses related to capture within 7 days of being hooked, handled and released.

TPWD biologists used sport-fishing techniques to capture spotted seatrout for tagging purposes. These 'sport fishermen' had a lower total by-catch ratio than NMFS surveyed fishermen. TPWD professionals caught and released about one fish for every fish tagged. If it is assumed that fishermen fishing specifically for spotted seatrout would retain other desired species, (e.g., red drum or Atlantic croaker) the estimated by-catch by these specialty fishermen would be even less.

Because by-catch occurs during the fishing activity, typical sampling methods, such as intercept surveys conducted at the completion of the fishing trip, do not provide verifiable data for estimating the composition and magnitude of the by-catch. Studies have shown that the marine

fishermen, in general, can not identify accurately the fish they catch, nor recall accurately specific events, such as the total numbers, by species, of fish caught. Therefore, studies relying on recall alone would produce data of limited utility for a fisheries manager.

Additional studies suggested to further explore recreational by-catch include: limiting by-catch recall studies to those species under management regulations, using professionals (e.g., TPWD, NMFS, university or other biologists) to emulate sport-fishermen to determine composition and magnitude of by-catch, using volunteer fishermen to record catch information in logbooks, and conducting hooking and handling mortality studies of selected species.

No estimates for recreational shellfish by-catch were possible due to lack of information. It is believed that the magnitude of recreational shellfish by-catch is small relative to the by-catch of commercial shellfish fishermen due to limited recreational participation and stringent recreational possession regulations.